

New genera and new species of the family Linyphiidae from Borneo, Sumatra and Java (Arachnida, Araneae)

Andrei V. Tanasevitch

A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninsky prospekt, 33, Moscow 119071, Russia. E-mail: tanasevitch@gmail.com

Abstract: Two new genera and seven new species of the family Linyphiidae from the collections of the Muséum d'histoire naturelle de Genève are described: *Kalimagona* gen. nov. with *Kalimagona cuspidata* sp. nov. (the type species) and *K. rotunda* sp. nov. from Borneo; *Tegulinus* gen. nov. with *Tegulinus sumatranus* sp. nov. (the type species) and *T. bifurcatus* sp. nov. from Sumatra; *Dumoga buratino* sp. nov. and *Prosoponoides jaubi* sp. nov. from Sumatra; and *Oedothorax bifoveatus* sp. nov. from Borneo and Java. A list of the linyphiid species currently known from Borneo, Sumatra and Java is presented.

Keywords: Erigoninae - Linyphiinae - Southeast Asia - East Malaysia - Indonesia.

INTRODUCTION

At present, about 140 linyphiid species from 69 genera have been described or recorded from Southeast Asia (see Locket, 1982; Millidge & Russell-Smith, 1992; Barrion & Litsinger, 1995; Millidge, 1995; Helsdingen, 1969, 1985a, b; Heimer, 1984; Saaristo & Tanasevitch, 2003a, b; Tu & Li, 2004; Tanasevitch, 2014a, b, 2015, 2016, 2017). The present paper adds to this list another two new genera and seven new species, which are here described from Borneo, Sumatra and Java. According to new data the linyphiid faunas of these islands are currently known to contain 24, 26 and 12 species, respectively (see Table 1).

MATERIAL AND METHODS

This paper is based on material kept at the Muséum d'histoire naturelle de Genève, Switzerland (MNHG). Specimens preserved in 70% ethanol were studied using a MBS-9 stereomicroscope. A Levenhuk C-800 digital camera was used for some drawings. Images taken at multiple focal planes were combined using the Helicon Focus image stacking software, version 5.1. Sample numbers are given in square brackets.

The terminology of copulatory organs mainly follows that of Merrett (1963), Hormiga (1994, 2000) and Tanasevitch (2015). The chaetotaxy is given in a formula, e.g.,

2.2.1.1, which refers to the number of dorsal spines on tibiae I-IV. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. Figure numbers are given above the scale lines, the corresponding distance below.

Abbreviations

- a.s.l. Above sea level
- C Convector *sensu* Tanasevitch (1998) = lamella *sensu* Merrett (1963)
- DAC Distal apophysis of convector *sensu* Tanasevitch (2015)
- DSA Distal suprategular apophysis *sensu* Hormiga (2000)
- E Embolus
- EM Embolic membrane *sensu* Tanasevitch (2017), not *sensu* Helsdingen (1986) and Hormiga (1994)
- EP Embolus proper *sensu* Saaristo (1971)
- Fe Femur
- MA Median apophysis
- MM Median membrane *sensu* Helsdingen (1965) = embolic membrane *sensu* Helsdingen (1986) and Hormiga (1994)
- Mt Metatarsus
- P Paracymbium
- R Radix
- RA Radical apophysis

T Tegulum
 Ti Tibia
 TmI Position of trichobothrium on metatarsus I

TAXONOMIC PART

Dumoga Millidge & Russell-Smith, 1992

Type species: *Dumoga arboricola* Millidge & Russell-Smith, 1992.

Dumoga buratino sp. nov.

Figs 1-8, 11-18

Holotype: Male; Indonesia, Sumatra, Jambi Province, Mt Kerinci, footpath to summit, N of Kersik Tua, 1800-1980 m a.s.l., montane rain forest, sifting; 16.II.2000; leg. P. Schwendinger [Sum-00/12].

Paratypes: 1 male, 2 females; collected together with the holotype.

Diagnosis: The new species is characterized by the peculiar shape of its carapace and highly modified palpal tibia in the male, as well as by the rounded dorsal plate of the epigyne in the female.

Etymology: The specific epithet is a noun in apposition, referring to the long-nosed Russian fairy-tale character "Buratino".

Description: *Male (paratype).* Large-sized Erigoninae, total length 3.13, habitus as shown in Fig. 1. Carapace modified (Figs 2-3), 1.65 long, 1.00 wide, reddish brown, with a pale, globular elevation in the middle. Anterior part of carapace protruded forwards, bearing anterior median eyes. Sulci situated at base of central globular outgrowth. Chelicerae 0.63 long, mastidion absent, anterior margin of fang groove with 5 strong teeth. Legs pale reddish brown. Leg I 6.93 long (1.95+0.35+1.78+1.55+1.30), leg IV 5.78 long (1.80+0.28+1.45+1.38+0.87). Chaetotaxy 2.2.1.1, length of spines about 2 diameters of segment. TmI 0.40. All metatarsi with trichobothrium. Palp (Figs 11-15): Tibia massive, highly modified. Proximal part of paracymbium narrow, middle part with a large rounded outgrowth, distal part hook-shaped. Suprategular apophysis complex, with several outgrowths. Column relatively large, looking like a spongy membranous tissue. Median membrane narrow, protruded forwards. Radix very small, embolus thin, long, making two loops. Abdomen 1.50 long, 1.00 wide, dorsally pale, with several dark spots as shown in Fig. 1.

Female. Total length 2.75, habitus as shown in Fig. 4. Carapace 1.33 long, 1.00 wide, unmodified, reddish brown, with a pale spot in the middle. Chelicerae 0.63 long, anterior margin of fang groove with 5 strong teeth. Legs reddish brown. Leg I 6.34 long

(1.68+0.38+1.65+1.53+1.10), leg IV 5.18 long (1.50+0.33+1.35+1.30+0.70). Chaetotaxy as in male. TmI 0.44. Abdomen 1.50 long, 1.05 wide, dorsal pattern as shown in Fig. 4. Epigyne (Figs 5-8, 16-18) prominent, aperture lacking, dorsal plate rounded, receptacles elongated.

Taxonomic remarks: The new species seems to be most similar to *D. complexipalpis* Millidge & Russell-Smith, 1992, known from males, but clearly differs by the shape of its carapace, by the arrangement of apophyses on the palpal tibia, as well as by the shape of the distal suprategular apophysis.

Distribution: Known only from the type locality on Sumatra Island, Indonesia.

Prosoponoides Millidge & Russel-Smith, 1992

Type species: *Prosoponoides hamatum* Millidge & Russel-Smith, 1992.

Prosoponoides jambi sp. nov.

Figs 9-10, 19-21

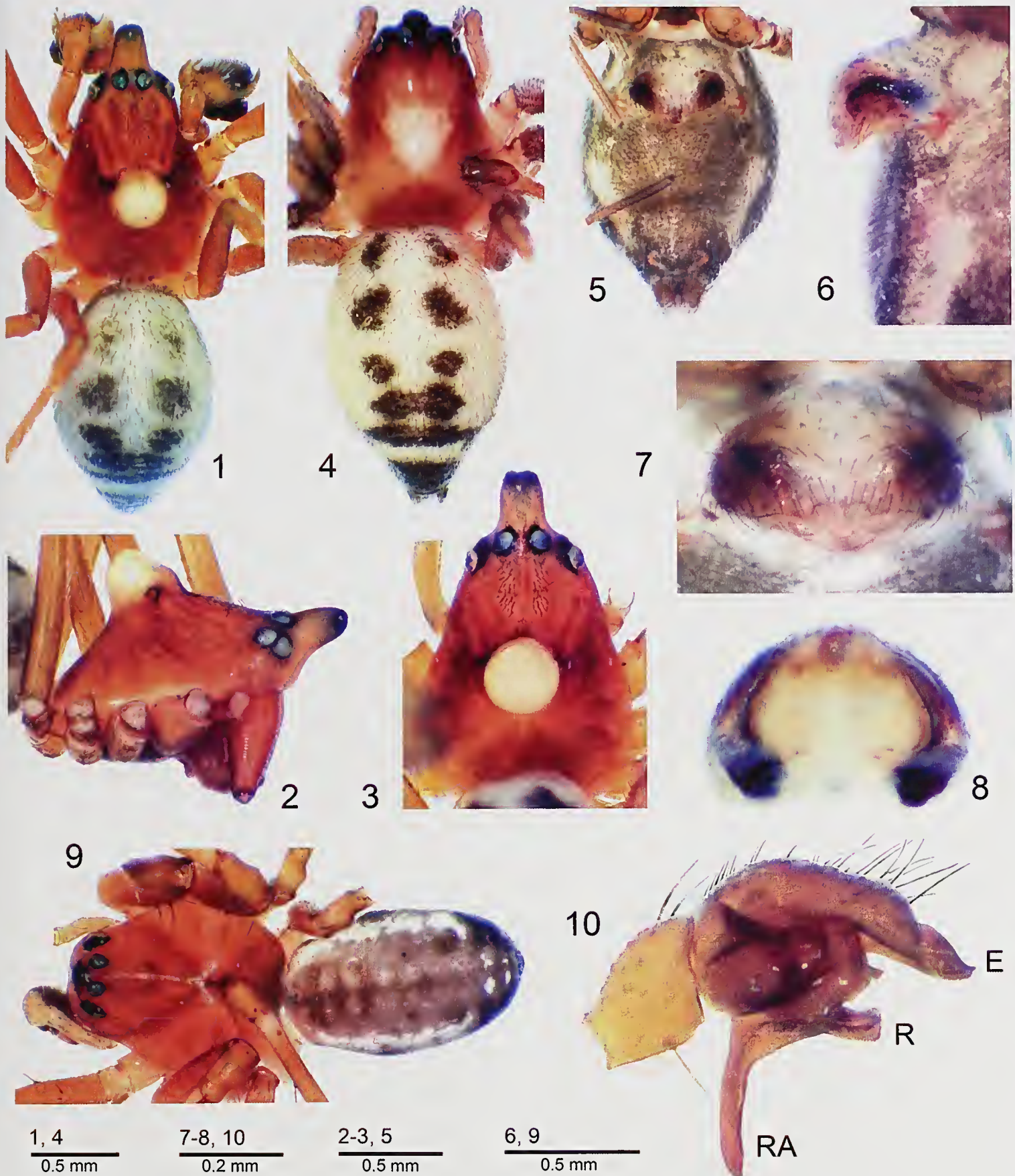
Holotype: Male; Indonesia, Sumatra, Jambi Province, Mt Kerinci, footpath to summit, N of Kersik Tua, 2160 m a.s.l., montane rain forest, sifting; 17.-18. II.2000; leg. P. Schwendinger [Sum-00/13].

Other material examined: MHNG; male holotype of *Prosoponoides hamatum* Millidge & Russel-Smith, 1992. – MHNG; male holotype of *P. simile* Millidge & Russel-Smith, 1992. – MHNG; male holotype of *Kenocymbium deelemanae* Millidge & Russel-Smith, 1992.

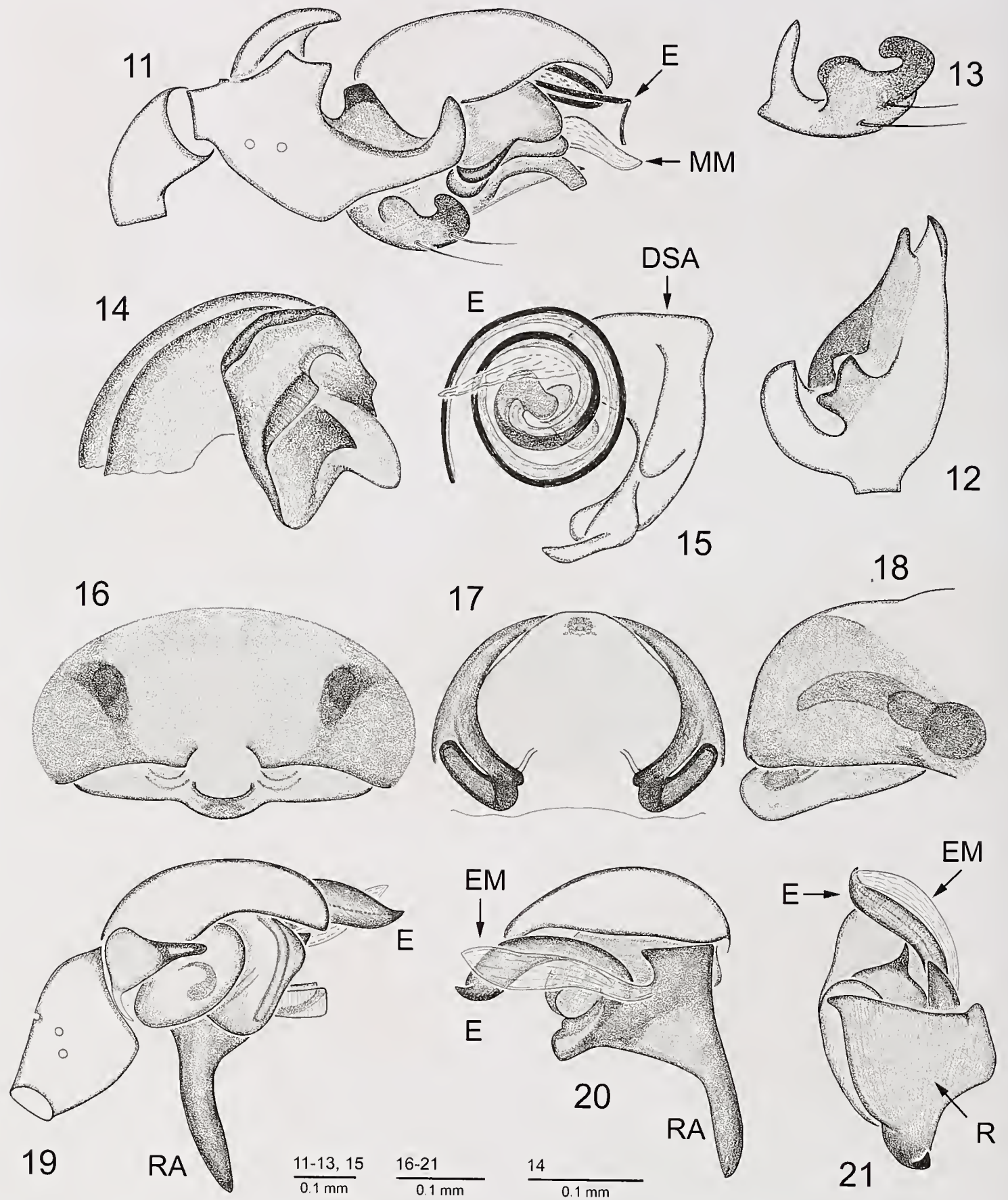
Etymology: The specific epithet is a noun in apposition referring to the "terra typica", the Jambi Province.

Diagnosis: The new species is characterized by the strongly reduced distal part of the paracymbium, by the thick and long embolus, as well as by the presence of a long, downward-directed process on the convector.

Description: *Male (holotype).* Medium-sized Linyphiinae, total length 2.30, habitus as shown in Fig. 9. Carapace 1.05 long, 0.80 wide, unmodified, reddish brown, with darkened cephalic part and indistinct grey radial stripes as well as with darker margin; sulci absent. Chelicerae 0.50 long, mastidion absent. Legs reddish brown, end of segments darkened. Fe I 1.50 long. Leg IV 3.95 long (1.05+0.25+0.95+1.10+0.60). Chaetotaxy. FeI: 1-2-0-0, II-IV: 1-0-0-0; TmI: 2-1-1-0, III: 2-0-0-1, IV: 2-1-0-0. TmI 0.22. Metatarsus IV without trichobothrium. Palp (Figs 10, 19-21): Proximal part of paracymbium triangular and projecting forwards, distal part short, narrow, slightly curved, transparent, poorly visible. Distal suprategular apophysis small, claw-shaped.



Figs 1-10. Photographs of *Dumoga buratino* sp. nov., male and female paratypes (1-8), and of *Prosoponoides jambi* sp. nov., male holotype (9-10). (1, 9) Male habitus, dorsal view. (2-3) Male cephalothorax, lateral and dorsal view, respectively. (4) Female habitus, dorsal view. (5-6) Female abdomen, ventral and lateral view, respectively. (7-8) Epigyne, ventral and dorsal view, respectively. (10) Palp, retrolateral view.



Figs 11-21. *Dumoga buratino* sp. nov., male and female paratypes (11-18), and *Prosoponoides jambi* sp. nov., male holotype (19-21). (11, 19) Right palp, retrolateral view. (12) Palpal tibia, dorsal view. (13) Paracymbium. (14) Distal suprategular apophysis. (15) Distal suprategular apophysis and embolic division. (16-18) Epigyne, ventral, dorsal and lateral view, respectively. (20) Cymbium and palpal organ of right palp, prolateral view. (21) Embolic division, ventral view.

Embolus thick, slightly bent. Embolic membrane a long, narrow stripe. Radix large, flat, with a long apophysis directed downwards. Abdomen 1.20 long, 0.70 wide, dorsal pattern as shown in Fig. 9.

Female. Unknown.

Taxonomic remarks: The new species is similar to *Prosoponoides hamatum*, known from northern Sumatra, but clearly differs by a twice shorter distal part of the paracymbium (not shown on palp illustrations of *P. hamatum* in Millidge & Russel-Smith, 1992), as well as by its thick embolus and the presence of a specific process on the convector.

Distribution: Known only from the type locality on Sumatra Island, Indonesia.

Kalimagone gen. nov.

Type species: *Kalimagone cuspidata* sp. nov.

Diagnosis: The new genus belongs to the subfamily Erigoninae and is characterized by the following combination of characters: Medium-sized spiders, total length 1.70-1.95. Chaetotaxy formula 2.2.1.1, trichobothrium on MtIV absent. Male carapace unmodified, sulci absent; chelicerae unmodified, mastidion absent. Distal suprategular apophysis well-developed, protruding far beyond tip of cymbium and bearing a sable-shaped process in the middle. Radix small, embolus long, relatively narrow, directed forwards. The female is characterized by the presence of a median plate on the epigyne, by short seminal ducts and relatively small receptacles situated on both sides of the median plate.

Etymology: The generic name is a combination of two words: “Kalimantan”, the “terra typica”, and a part of the generic name *Erigone*; the gender is feminine.

Species included: *Kalimagone cuspidata* sp. nov. and *K. rotunda* sp. nov.

Taxonomic remarks: The conformation of the male palp of *Kalimagone* gen. nov., namely the presence of a well-developed distal suprategular apophysis, a small radix with a long embolus, a modified palpal tibia, as well as the chaeto- and trichobothriotaxy is similar to that of some representatives of *Gongylidioides* Oi, 1960, especially of *G. keralaensis* Tanasevitch, 2011 and *G. pectinatus* Tanasevitch, 2011, both known from India (Tanasevitch, 2011). The new genus is distinguished from *Gongylidioides* by the absence of a convector (a sclerite in the embolic division which is protecting the embolus), as well as by the structure of the epigyne, namely by the presence of a median plate. The shape of the epigyne resembles that of *Oedothorax* Bertkau in Förster & Bertkau, 1883, but *Oedothorax* species have a totally different conformation of the male palp.

Distribution: Known from Sabah on Borneo Island.

Kalimagone cuspidata sp. nov.

Figs 22-26, 35-41

Holotype: Male; Borneo, East Malaysia, Sabah, West Coast Residency, Kinabalu National Park, Mt Kinabalu, 2590 m a.s.l., misty forest below Layang Layang, plant debris in wet ravine, sifting; 1.V.1987; leg. D. Burckhardt & I. Löbl [#10a].

Paratypes: 2 males, 20 females; collected together with the holotype. – 1 male; Mt Kinabalu, 1750 m a.s.l., Liwagu Trail, rotten wood and other debris along trunk at foot of stump, sifting bark; 27.IV.1987; leg. D. Burckhardt & I. Löbl [#5a]. – 1 male; Mt Kinabalu, 1540 m a.s.l., Liwagu Trail, plant debris in small ravine at foot of old trees, sifting; 29.IV.1987; leg. D. Burckhardt & I. Löbl [#8a].

Diagnosis: This species is characterized by the presence of a short, narrow process on the male palpal tibia, by the apically pointed distal suprategular apophysis in the male, as well as by the rounded receptacula in the female.

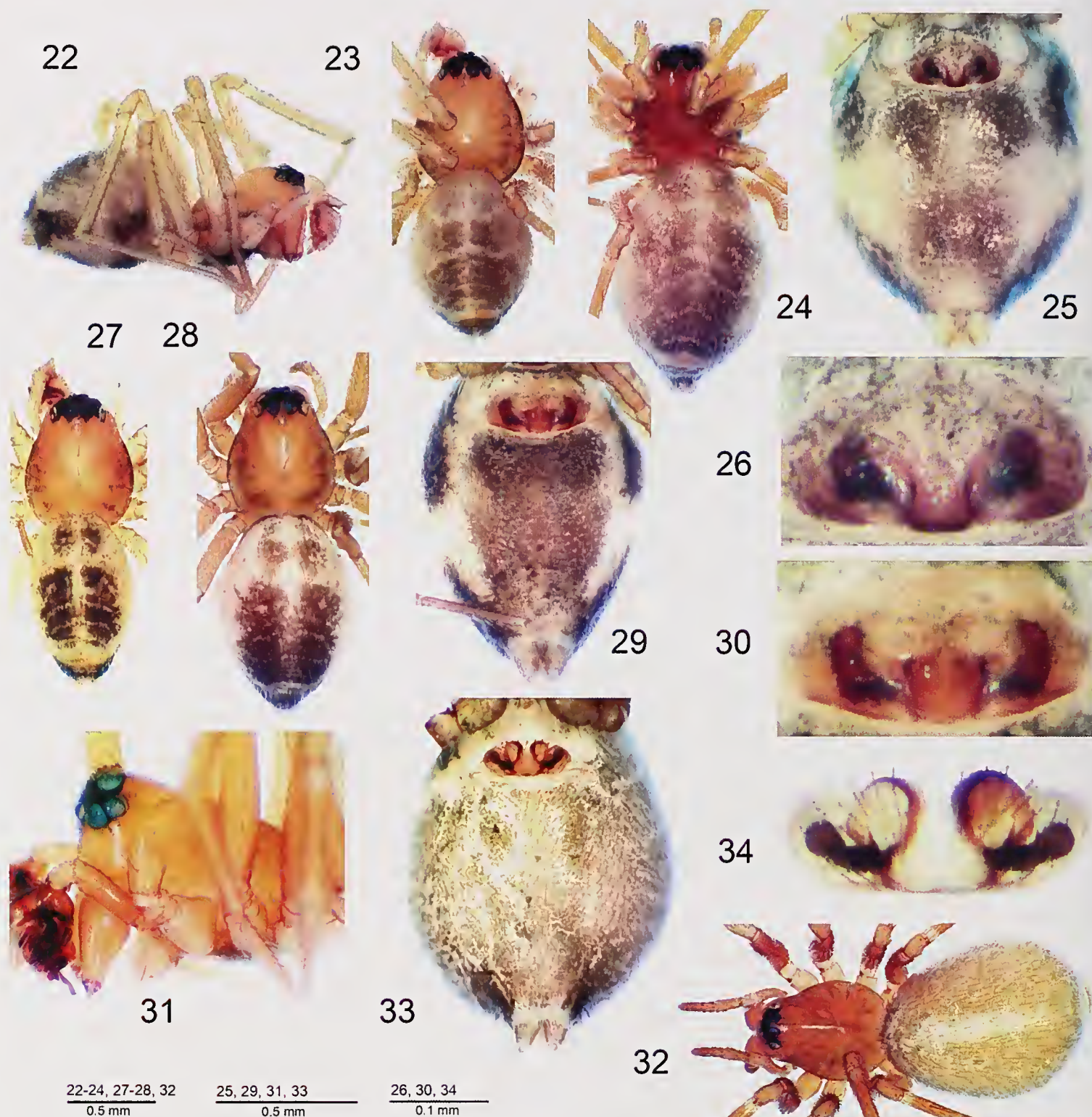
Etymology: The specific epithet is a Latin adjective referring to the shape of the apical part of the distal suprategular apophysis.

Description: *Male (paratype).* Total length 1.75, habitus as shown in Figs 22-23. Carapace unmodified, 0.85 long, 0.68 wide, pale yellow-brown, with indistinct, grey, radial stripes and darker margin; sulci absent. Chelicerae 0.35 long. Legs yellow. Leg I 3.37 long (0.88+0.23+0.88+0.75+0.63), leg IV 3.26 long (0.88+0.20+0.88+0.80+0.50). Chaetotaxy 2.2.1.1, length of spines about 1.5-2 diameters of segment. TmI 0.55. All metatarsi with a trichobothrium. Palp (Figs 35-40): Tibia elongated, ending in a short, narrow process. Paracymbium L-shaped, with a small, sharp tooth in middle part. Tegulum narrowed, pale. Distal suprategular apophysis massive, with a long median apophysis (MA in Figs 36, 40). Radix small, rounded, embolus relatively long and narrow. Abdomen 1.03 long, 0.70 wide, dorsal pattern as shown in Fig. 23.

Female. Total length 1.88, habitus as shown in Fig. 24. Carapace unmodified, 0.88 long, 0.70 wide. Chelicerae 0.35 long. Leg I 3.38 long (1.00+0.25+0.88+0.70+0.55), leg IV 3.33 long (0.95+0.25+0.85+0.80+0.48). Chaetotaxy 2.2.1.1, length of spines about 2-3 diameters of segment. TmI 0.61. Abdomen 1.13 long, 0.75 wide, dorsal and ventral pattern as shown in Figs 24 and 25, respectively. Epigyne (Figs 25-26, 41): median plate with straight or slightly curved lateral edges, receptacles rounded. Carapace and leg coloration as in male.

Taxonomic remarks: The species is similar to its only known congener, *Kalimagone rotunda* sp. nov. (see below).

Distribution: Known only from the type locality in the northeast of Borneo Island.



Figs 22-34. Photographs of *Kalimagone cuspidata* sp. nov., male and female paratypes from Mt Kinabalu (22-26), of *K. rotunda* sp. nov., male holotype and female paratype (27-30), and of *Oedothis bifoveatus* sp. nov., male and female paratypes from Cibodas Botanical Garden (31-34). (22-23, 27) Male habitus. (31) Male cephalothorax, lateral view. (24, 28, 32) Female habitus. (25, 29, 33) Female abdomen, ventral view. (26, 30, 34) Epigyne, ventral view.

***Kalimagone rotunda* sp. nov.**

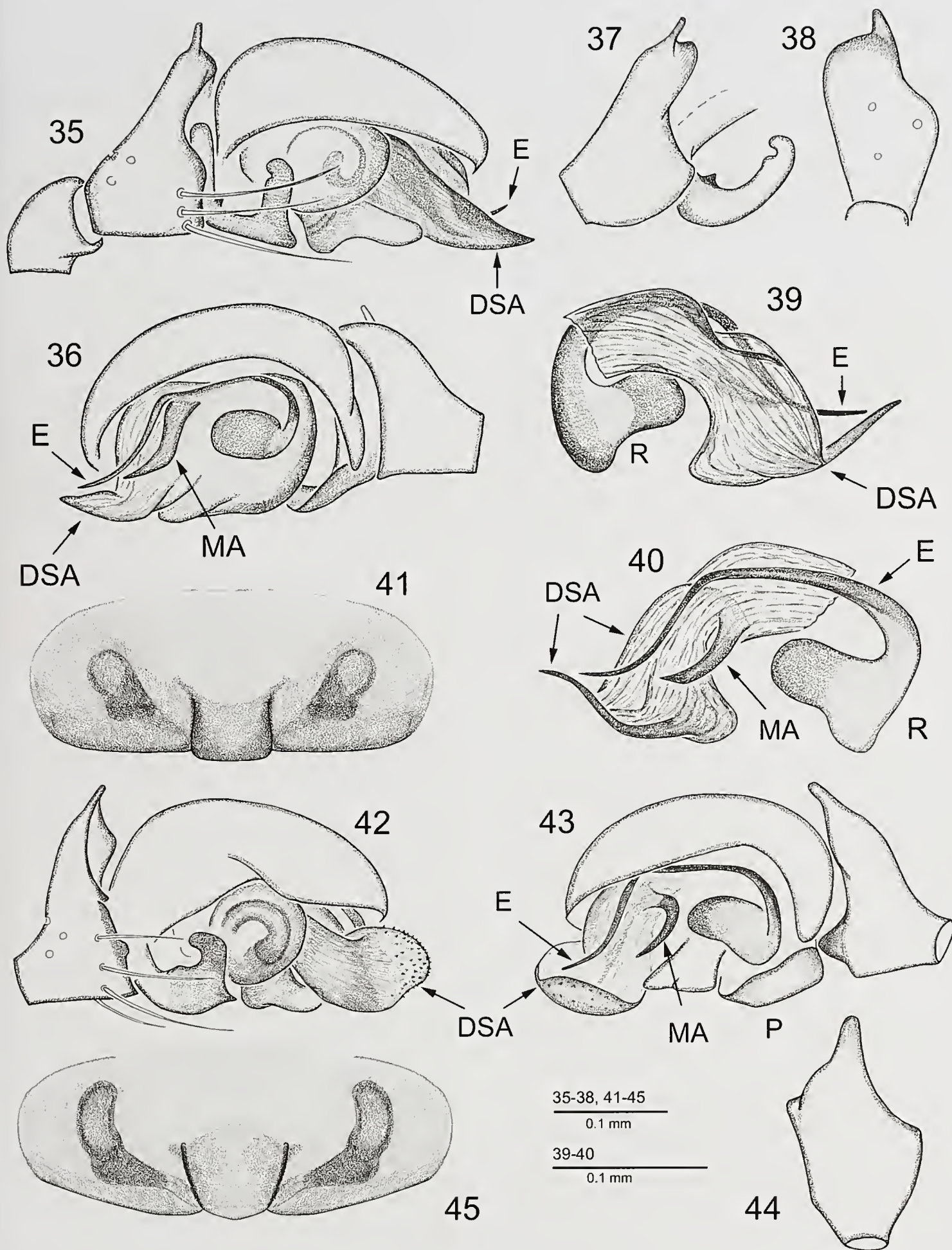
Figs 27-30, 42-45

Holotype: Male; Borneo, East Malaysia, Sabah, Tambunan District, Crocker Range, W slope, ca 1600 m a.s.l., 51-52 km from road Kota Kinabalu to Tambunan, rainforest with *Lithocarpus*, *Castanopsis* and tree ferns, plant debris in wet ravine and at forest edge, sifting; 18.V.1987; leg. D. Burckhardt & I. Löbl [#30a].

Paratypes: 5 females; collected together with the holotype.

Etymology: The specific name is a Latin adjective meaning "rounded", referring the shape of the distal part of the distal suprategular apophysis.

Diagnosis: The species is characterized by the peculiar shape of the palpal tibia and the rounded distal part of



Figs 35-45. *Kalimagone cuspidata* sp. nov., male and female paratypes from Mt Kinabalu (35-41), and *Kalimagone rotunda* sp. nov., male holotype and female paratype (42-45). (35, 42) Right palp, retrolateral view. (36, 43) Right palp, prolateral view. (37) Palpal tibia and paracymbium, retrolateral view. (38, 44) Palpal tibia, dorsal view. (39-40) Distal suprategular apophysis and embolic division, different aspects. (41, 45) Epigyne, ventral view.

the distal suprategular apophysis in the male, as well as by the bean-shaped receptacles in the female.

Description: *Male (paratype)*. Total length 1.77, habitus as shown in Fig. 27. Carapace unmodified, 0.80 long, 0.65 wide, pale brown, with indistinct, grey, radial stripes and darker margin; sulci absent. Chelicerae long 0.35. Legs yellow. Leg I 3.61 long (0.95+0.25+0.93+0.85+0.63), leg IV 3.39 long (0.90+0.23+0.85+0.88+0.53). Chaetotaxy 2.2.1.1, length of spines about 1.5-2 diameters of segment. TmI 0.59. All metatarsi with a trichobothrium. Palp (Figs 42-44): Tibia conically elongated. Paracymbium L-shaped. Tegulum small, narrow, pale. Distal suprategular apophysis flat, long and wide, with a claw-shaped median apophysis (MA in Fig. 43). Distal part of distal suprategular apophysis rounded, expanded, carrying tiny denticles, bent apically. Radix small, flat, embolus relatively long and narrow. Abdomen 1.05 long, 0.70 wide, dorsal pattern as shown in Fig. 27.

Female. Total length 1.93, habitus as shown in Fig. 28. Carapace unmodified, 0.78 long, 0.70 wide. Chelicerae 0.35 long. Leg I 3.19 long (0.88+0.25+0.80+0.73+0.53), leg IV 3.04 long (0.88+0.23+0.80+0.70+0.43). Chaetotaxy 2.2.1.1, length of spines about 2-2.5 diameters of segment. TmI 0.59. Abdomen 1.25 long, 0.78 wide, dorsal and ventral pattern as shown in Figs 28 and 29, respectively. Epigyne (Figs 29-30, 45): median plate with parallel or slightly posteriorly convergent edges, receptacles bean-shaped. Body and leg coloration as in male.

Taxonomic remarks: The species is very similar to *K. cuspidata*, but can easily be distinguished by the rounded, serrate distal part of the distal suprategular apophysis in the male, as well as by the shape of the median plate of the epigyne and the bean-shaped receptacles in the female.

Distribution: Known only from the type locality in the northeast of Borneo Island.

Oedothorax Bertkau in Förster & Bertkau, 1883

Type species: *Oedothorax gibbosus* (Blackwall, 1841).

Remarks: The new species described below is the tenth *Oedothorax* species recorded from the Oriental Realm, and it is the second one known from Southeast Asia, besides *O. convector* Tanasevitch, 2014 (Tanasevitch, 2014b).

***Oedothorax bifoveatus* sp. nov.**

Figs 31-34, 46-51

Holotype: Male; Indonesia, Java, Cibodas Botanical Garden, near Cipanas, ca 50 km E of Bogor, 1400 m a.s.l., vegetational debris in montane *Lithocarpus*

& *Castanopsis* forest, sifting; 3.-6.XI.1989; leg. D. Burckhardt, I. Löbl & D. Agosti [#2a].

Paratypes: 2 males, 17 females; collected together with the holotype. – 1 male, 21 females; Java, Gunung Gede - Pangrango National Park, near Cibodas, 6°47'0"S, 107°01'0"E, 1450-1600 m a.s.l.; 4.-11.V.2005; leg. A. Schulz [AS-05/11]. – 3 males, 1 female; East Malaysia, Borneo Island, Sabah, Tambunan District, Crocker Range, near pass, 1550-1650 m a.s.l., road Kota Kinabalu to Tambunan, *Lithocarpus* & *Castanopsis* forest, sifting dead wood, leaves and moss; 16.V.1987; leg. D. Burckhardt & I. Löbl [#27a].

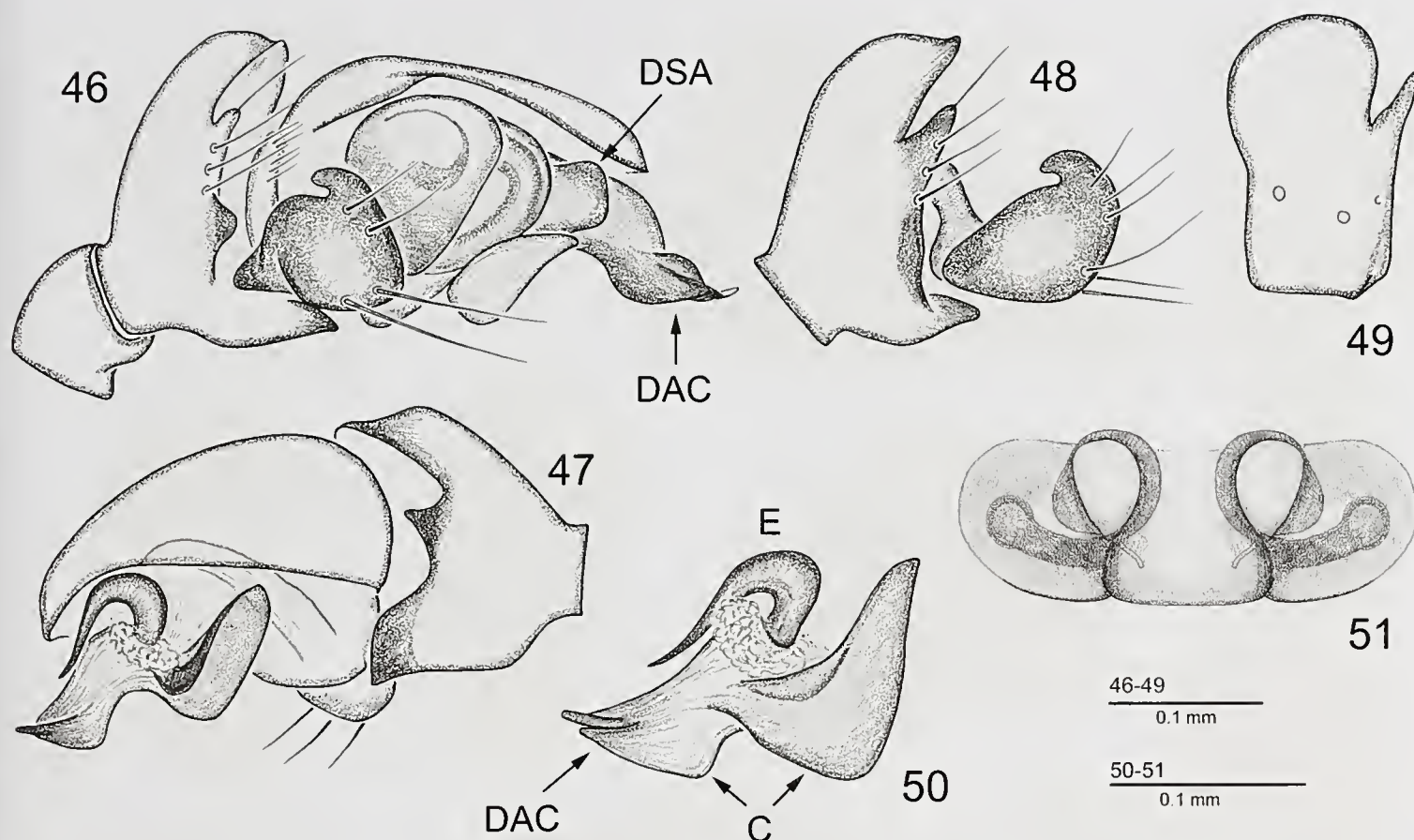
Etymology: The species name is an adjective derived from the Latin "fovea", meaning "a pit", a "socket", referring to the structure of the epigyne.

Diagnosis: The species is characterized by the unmodified carapace, by the peculiar shape of the palpal tibia, as well as by the curved shape of the convector in the male. The female is characterized by the specific structure of the epigyne, namely by the presence of two large sockets on either side of the median plate.

Description: *Male (holotype)*. Total length 1.83. Carapace (Fig. 31) unmodified, 0.95 long, 0.70 wide, greyish pale yellow-brown, with indistinct, grey, radial stripes and darker margin; sulci absent. Chelicerae 0.38 long, mastidion absent. Legs yellow. Leg I 3.43 long (0.90+0.25+0.88+0.80+0.60), IV 3.33 long (0.88+0.25+0.85+0.85+0.50). Chaetotaxy 2.2.1.1, length of spines about 1-1.5 diameters of segment. TmI 0.61. All metatarsi with trichobothrium. Palp (Figs 46-50): Tibia with a narrow notch retrolaterally and a sharp tooth prolaterally. Paracymbium with a massive distal part, bearing several strong, long spines. Distal suprategular apophysis short and wide. Convector large, spindly curved, distal apophysis (DAC in Figs 46, 50) ending in several short, pointed processes. Abdomen 0.95 long, 0.70 wide, dorsally grey, with a pale, longitudinal stripe.

Female. Total length 2.23, habitus as shown in Fig. 32. Carapace 0.88 long, 0.40 wide, unmodified. Chelicerae 0.40 long. Leg I 3.18 long (0.88+0.25+0.80+0.75+0.50), leg IV 3.16 long (0.88+0.25+0.80+0.75+0.48). TmI 0.62. Abdomen 1.28 long, 1.00 wide, dorsal and ventral pattern as shown in Figs 32 and 33, respectively. Epigyne (Figs 33-34, 51) with two large rounded sockets on either side of median plate. Receptacles small, rounded. Body coloration, leg coloration and chaetotaxy as in male.

Taxonomic remarks: By the unmodified carapace and by the structure of the embolic division, namely the small embolus and the shape of the convector, the new species resembles several Oriental congeners, e.g., *O. cumur* Tanasevitch, 2015 or *O. rusticus* Tanasevitch, 2015, but is clearly distinguished from those and other



Figs 46-51. *Oedothorax bifoveatus* sp. nov., male and female paratypes from Cibodas Botanical Garden. (46-47) Right palp, retrolateral and prolateral view, respectively. (48) Palpal tibia and paracymbium, retrolateral view. (49) Palpal tibia, dorsal view. (50) Embolic division. (51) Epigyne, ventral view.

congeners by the structure of the epigyne, namely by the presence two large, rounded sockets on either side of the median plate.

Distribution: Known from Borneo Island, East Malaysia, and from Java Island, Indonesia.

Tegulinus gen. nov.

Type species: *Tegulinus sumatranus* sp. nov.

Etymology: The generic name is derived from the Latin "tegulum", the shape of which is a main character of the genus; the gender is masculine.

Diagnosis: The new genus belongs to the subfamily Erigoninae and is characterized by the following combination of characters: Rather large-sized spiders, total length 1.90-2.25. Chaetotaxy formula 2.2.1.1, all metatarsi with a trichobothrium. Carapace and palpal tibia of males modified; sulci and mastidion absent. Tegulum strongly protruded downwards; distal suprategular apophysis well-developed, long, narrow; embolus small; convector present, simple.

Species included: *Tegulinus sumatranus* sp. nov. and *T. bifurcatus* sp. nov.

Taxonomic remarks: The taxonomic position of

this new genus is unclear, especially as the female is unknown. The conformation of the embolic division, namely the shape of the small embolus and the structure of the convector, somewhat resembles that of some Oriental species of *Oedothorax* Bertkau in Förster & Bertkau, 1883, e.g., *O. meghalaya* Tanasevitch, 2015 or *O. stylus* Tanasevitch, 2015. The discovery of congeneric females and/or other representatives of *Tegulinus* gen. nov. should clarify the position of the genus among the Erigoninae.

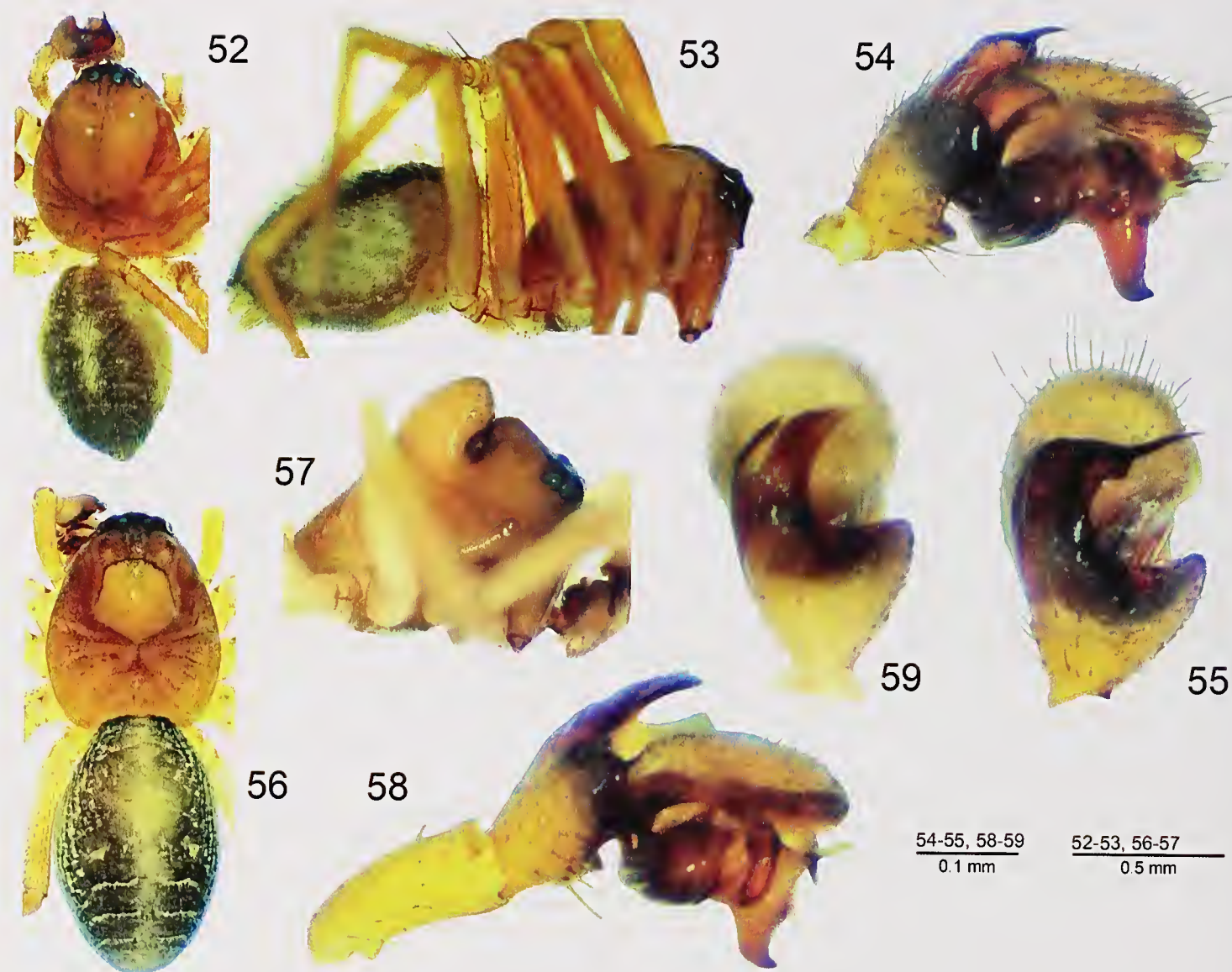
Distribution: Known only from Sumatra Island, Indonesia.

Tegulinus sumatranus sp. nov.

Figs 52-55, 60-64

Holotype: Male; Indonesia, Sumatra, Jambi Province, Mt Kerinci, 3300 m a.s.l., low Ericaceae scrub, sifting of vegetational debris; 12.XI.1989; leg. D. Burckhardt, I. Löbl & D. Agosti [#12a].

Paratypes: 1 male; collected together with the holotype. – 1 male; Mt Kerinci, 2100 m a.s.l., vegetational debris, transition upper montane *Lithocarpus* & *Castanopsis* to moss forest, sifting; 14.XI.1989; leg. D. Burckhardt, I. Löbl & D. Agosti



Figs 52-59. Photographs of *Tegulinus sumatranus* sp. nov., male paratype from Mt Tujuh (52-55), and of *T. bifurcatus* sp. nov., male holotype (56-59). (52-53, 56) Habitus. (57) Cephalothorax, lateral view. (54, 58) Right palp, retrolateral view. (55, 59) Palpal tibia, dorsal view.

[#16]. – 1 male; Mt Kerinci, footpath to summit, N of Kersik Tua, 1800-1980 m a.s.l., montane rain forest, sifting; 16.II.2000; leg. P. Schwendinger [Sum-00/12]. – 3 males; Mt Kerinci, footpath to summit, N of Kersik Tua, 2160 m a.s.l., montane rain forest, sifting; 17.-18. II.2000; leg. P. Schwendinger [Sum-00/13]. – 2 males; Jambi Province, Mt Tujuh, footpath to Lake Mt Tujuh, 1500-2000 m a.s.l., montane rain forest; 20.II.2000; leg. P. Schwendinger [Sum-00/15].

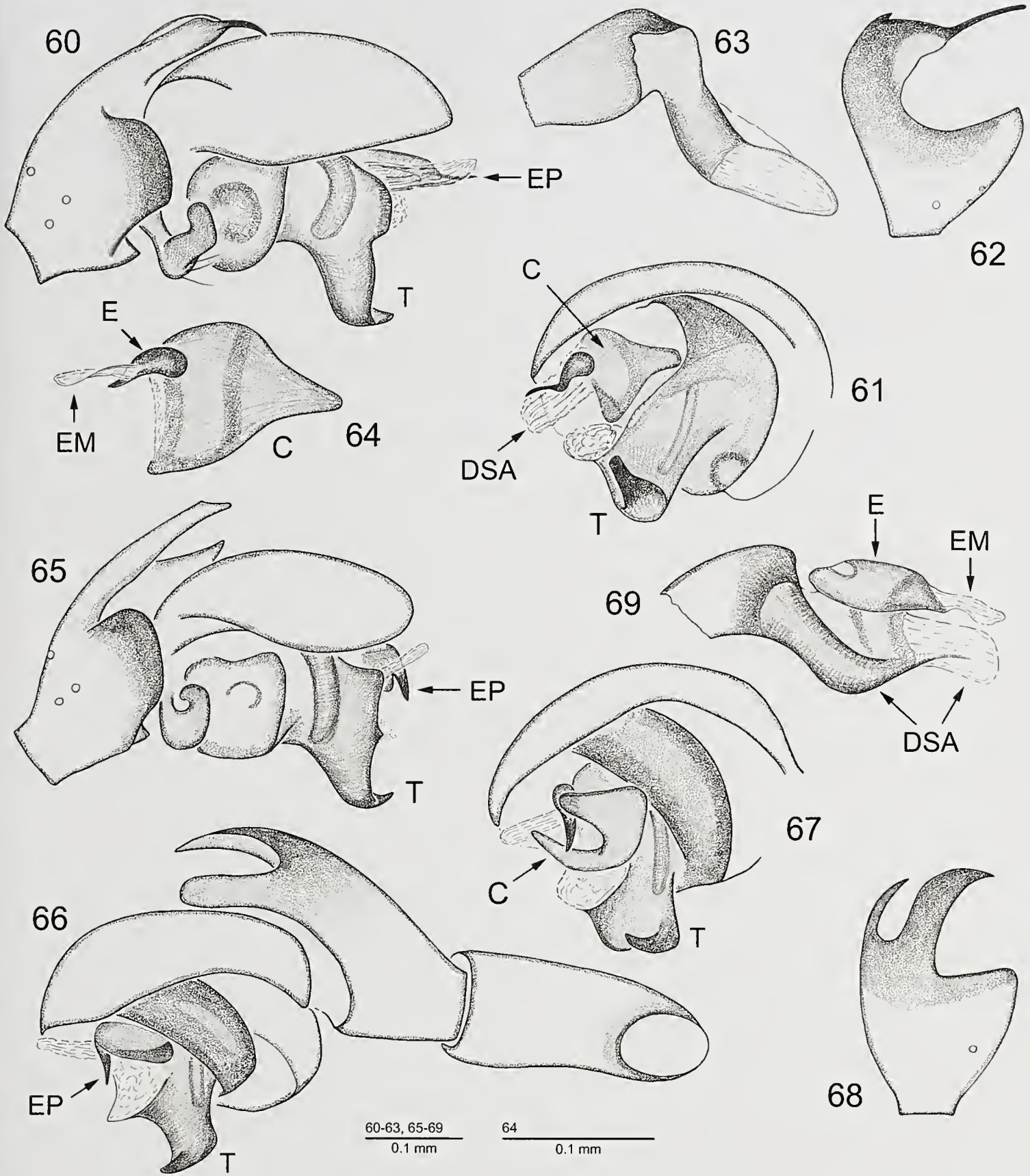
Etymology: The specific epithet, an adjective, refers to the “terra typica”, Sumatra Island.

Diagnosis: The species is characterized by the weakly modified carapace, and the presence of a specific process on the palpal tibia.

Description: *Male* (paratype from Mt Tujuh). Total length 2.15, habitus as shown in Figs 52-53. Carapace (Fig. 53) 1.05 long, 0.75 wide, pale yellow-

brown, convex dorsally, with indistinct, grey, radial stripes posteriorly; sulci absent. Chelicerae 0.38 long, mastidion absent. Legs yellow. Leg I 3.52 long (1.00+0.28+0.88+0.83+0.53), leg IV 3.34 long (0.95+0.25+0.78+0.88+0.48). Chaetotaxy 2.2.1.1, length of spines about 1.5-2 diameters of segment. TmI 0.77. All metatarsi with trichobothrium. Palp (Figs 54-55, 60-64): Tibia with a wide apophysis ending in a long, narrow, spear-like process. Paracymbium L-shaped, its distal part bearing several spines. Tegulum conical, strongly protruded downwards, pointed and bent apically. Distal suprategular apophysis relatively long, its distal part almost transparent. Convector relatively wide, triangular. Embolus small, comma-shaped, embolic membrane narrow, moderately sclerotized. Abdomen 1.00 long, 0.75 wide, dorsal pattern as shown in Fig. 52.

Female. Unknown.



Figs 60-69. *Tegulinus sumatranus* sp. nov., male paratype from Mt Tujuh (60-64), and *T. bifurcatus* sp. nov., male holotype (65-69). (60, 65) Right palp, retrolateral view. (61, 66, 67) Right palp, prolateral view. (62, 68) Palpal tibia, dorsal view. (63) Distal suprategular apophysis. (64) Embolic division. (69) Distal suprategular apophysis and embolus.

Taxonomic remarks: The new species is similar to its only known congener, *Tegulinus bifurcatus* sp. nov. (see below).

Distribution: Known only from two localities in the mountains of Jambi Province, Sumatra Island, Indonesia.

Tegulinus bifurcatus sp. nov.

Figs 56-59, 65-69

Holotype: Male; Indonesia, Sumatra, Jambi Province, Mt Kerinci, 3000 m a.s.l., 12.XI.1989; leg. D. Agosti, D. Burckhardt & I. Löbl [#13a].

Diagnosis: The species is characterized by the presence of a hump on the carapace, by the presence of two processes on the palpal tibia, as well as by the relatively small convector.

Etymology: The specific name is a Latin adjective referring to the shape of the male palpal tibia.

Description: *Male (holotype).* Total length 1.90, habitus as shown in Fig. 56. Carapace 0.90 long, 0.73 wide, pale brown, with a pale, rounded hump in the centre (Figs 56-57). Chelicerae 0.30 long, mastidion absent. Legs yellow. Leg I 2.96 long (0.85+0.25+0.70+0.68+0.48.), leg IV 2.93 long (0.80+0.23+0.70+0.75+0.45). Chaetotaxy unknown, spines lost. TmI 0.80. All metatarsi with trichobothrium. Palp (Figs 58-59, 65-69): Dorso-apical process of tibia divided into two branches.

Paracymbium small, L-shaped. Tegulum conical, strongly protruded downwards, pointed and bent apically. Distal suprategular apophysis small, ending in a narrow, almost transparent process. Convector with a deep hollow. Embolus small, comma-shaped. Abdomen 1.00 long, 0.75 wide, dorsal pattern as shown in Fig. 56. *Female.* Unknown.

Taxonomic remarks: The new species is similar to its only known congener, *T. sumatranus* sp. nov., but can be easily distinguished by the presence of a hump on the carapace and of two processes on the palpal tibia (*versus* only one in *T. sumatranus* sp. nov.).

Distribution: Known only from the type locality at high altitudes in Jambi Province, Sumatra Island, Indonesia.

BIOGEOGRAPHICAL PART

In Table 1 I give an overview of the occurrence of linyphiid spiders on Borneo, Sumatra, Java and continental SE-Asia. According to that, the fauna of these islands is not as poor in species as we previously thought and shows a high degree of presumed endemism. Among the 58 species listed, only 12 were recorded from continental Southeast Asia. Only one species, *Kaestneria bicultrata*, is also known from outside that region (southern China), and one species, *Ostearius melanopygius*, is a cosmopolite. The remaining species are presumably local or regional endemics.

Table 1. Occurrence of linyphiid spiders on Borneo, Sumatra, Java and in continental Southeast Asia, including new data.

Species	Borneo	Sumatra	Java	Continental SE Asia
<i>Bathypantes minor</i> Millidge & Russell-Smith, 1992	+			
<i>B. paracymbialis</i> Tanasevitch, 2014a		+		+
<i>Batueta baculum</i> Tanasevitch, 2014b	+	+		+
<i>Caenonetria perdita</i> Millidge & Russell-Smith, 1992	+			
<i>C. orientalis</i> Locket, 1982			+	+
<i>Dendronetria humilis</i> Millidge & Russell-Smith, 1992	+			
<i>D. obscura</i> Millidge & Russell-Smith, 1992	+			
<i>Dubiaranea deelemanae</i> Millidge, 1995	+			
<i>Dumoga buratino</i> sp. nov.		+		
<i>Enguterothrix simpulum</i> (Tanasevitch, 2014b)	+			+
<i>Eordea bicolor</i> Simon, 1899		+		
<i>Erigone bifurca</i> Locket, 1982		+		+
<i>Erigophantes borneoensis</i> Wunderlich, 1995	+			
<i>Helsdingenia hebesoides</i> Saaristo & Tanasevitch, 2003a		+		
<i>Indophantes barat</i> Saaristo & Tanasevitch, 2003b		+		
<i>I. kalimantanus</i> Saaristo & Tanasevitch, 2003b	+			

<i>I. kinabalu</i> Saaristo & Tanasevitch, 2003b	+			
<i>I. lehtineni</i> Saaristo & Tanasevitch, 2003b	+			
<i>I. sumatera</i> Saaristo & Tanasevitch, 2003b		+		
<i>Kaestneria bicultrata</i> Chen & Yin, 2000		+		
<i>Kalimagone cuspidata</i> sp. nov.	+			
<i>K. rotunda</i> sp. nov.	+			
<i>Kenocymbium deelemanae</i> Millidge & Russell-Smith, 1992		+		+
<i>Ketambea permixta</i> Millidge & Russell-Smith, 1992			+	
<i>K. rostrata</i> Millidge & Russell-Smith, 1992		+		
<i>K. vermiformis</i> Millidge & Russell-Smith, 1992			+	
<i>Knischatiria longispina</i> Wunderlich, 1995		+		
<i>Linyphia phyllophora</i> Thorell, 1890		+		
<i>Locketiella parva</i> Millidge & Russell-Smith, 1992	+			
<i>Locketina fissivulva</i> (Millidge & Russell-Smith, 1992)	+			
<i>L. pusilla</i> (Millidge & Russell-Smith, 1992)	+			
<i>Metalephyphantes kraepelini</i> (Simon, 1905)			+	
<i>Mitrager noordami</i> Helsdingen, 1985b			+	
<i>Nasooona asocialis</i> (Wunderlich, 1974)			+	
<i>N. crucifera</i> (Thorell, 1895)	+			
<i>Nasoonaria sinensis</i> Wunderlich, 1995		+		
<i>Nematogmus asiaticus</i> Tanasevitch, 2014a		+		
<i>N. dentimanus</i> Simon, 1886			+	
<i>Neriene amiculata</i> (Simon, 1905)			+	
<i>N. beccarii</i> (Thorell, 1890)		+		
<i>N. macella</i> (Thorell, 1898)		+	+	
<i>N. strandia</i> (Blauvelt, 1936)	+			
<i>N. sundaica</i> (Simon, 1905)			+	
<i>Oedothorax bifoveatus</i> sp. nov.	+		+	
<i>Ostearius melanopygius</i> (O. Pickard-Cambridge, 1880)	+			+
<i>Phyllarachne levicula</i> Millidge & Russell-Smith, 1992	+			
<i>Piesocalus javanus</i> Simon, 1894			+	
<i>Plectembolus quadriflectus</i> Millidge & Russell-Smith, 1992	+	+		+
<i>P. quinquefectus</i> Millidge & Russell-Smith, 1992		+		+
<i>P. similis</i> Millidge & Russell-Smith, 1992		+		
<i>Pronasooona sylvatica</i> Millidge, 1995	+			
<i>Prosoponoides hamatus</i> Millidge & Russell-Smith, 1992		+		+
<i>P. jambi</i> sp. nov.		+		
<i>P. kaharianus</i> Millidge & Russell-Smith, 1992	+			
<i>Tapinopa vara</i> Locket, 1982		+		+
<i>Tegulinus bifurcatus</i> sp. nov.		+		
<i>T. sumatranus</i> sp. nov.		+		
<i>Theoa hamata</i> Tanasevitch, 2014a		+		+
Total species	24	26	12	12

ACKNOWLEDGEMENTS

I am grateful to Peter Schwendinger (MHNG) for the opportunity to work with the collections of the MHNG and for his valuable comments on the manuscript. Thanks also go to an anonymous reviewer for commenting on the manuscript.

REFERENCES

- Barrion A.T., Litsinger J.A. 1995. Riceland Spiders of South and Southeast Asia. *CAB International, Wallingford, Oxon*, xix + 700 pp.
- Blackwall J. 1841. The difference in the number of eyes with which spiders are provided proposed as the basis of their distribution into tribes; with descriptions of newly discovered species and the characters of a new family and three new genera of spiders. *Transactions of the Linnean Society of London* 18: 601-670.
- Blauvelt H.H. 1936. The comparative morphology of the secondary sexual organs of *Linyphia* and some related genera, including a revision of the group. *Festschrift zum 60. Geburtstag von Professor Dr. Embrik Strand, Riga* 2: 81-171.
- Chen J.A., Yin C.M. 2000. On five species of linyphiid spiders from Hunan, China (Araneae: Linyphiidae). *Acta Arachnologica Sinica* 9: 86-93.
- Förster A., Bertkau P. 1883. Beiträge zur Kenntniss der Spinnenfauna der Rheinprovinz. *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens* 40: 205-278.
- Heimer S. 1984. A new linyphiid spider from Vietnam (Arachnida, Araneae). *Reichenbachia* 22: 87-89.
- Helsdingen P.J. van 1965. Sexual behaviour of *Leptyphantes leprosus* (Ohlert) (Araneida, Linyphiidae), with notes on the function of the genital organs. *Zoologische Mededelingen* 41: 15-42.
- Helsdingen P.J. van 1969. A reclassification of the species of *Linyphia* Latreille based on the functioning of the genitalia (Araneida, Linyphiidae), I. *Zoologische Verhandlungen* 105: 1-303.
- Helsdingen P.J. van 1985a. Araneae: Linyphiidae of Sri Lanka, with a note on Erigonidae. *Entomologica Scandinavica* (Suppl.) 30: 13-30.
- Helsdingen P.J. van 1985b. *Mitrager noordani*, an erigonine novelty from Java. *Bulletin of the British Arachnological Society* 6: 353-358.
- Helsdingen P.J. van 1986. World distribution of Linyphiidae (pp. 121-126). In: Eberhard W.E., Lubin Y.D., Robinson B.C. (eds). Proceedings of the Ninth International Congress of Arachnology, Panama 1983. *Smithsonian Institution Press, Washington D.C.*, 333 pp.
- Hormiga G. 1994. Cladistics and the comparative morphology of linyphiid spiders and their relatives (Araneae, Araneoidea, Linyphiidae). *Zoological Journal of the Linnean Society* 111: 1-71.
- Hormiga G. 2000. Higher level phylogenetics of erigonine spiders (Araneae, Linyphiidae, Erigoninae). *Smithsonian Contributions to Zoology* 609: 1-160.
- Locket G.H. 1982. Some linyphiid spiders from western Malaysia. *Bulletin of the British Arachnological Society* 5: 361-384.
- Merrett P. 1963. The palpus of male spiders of the family Linyphiidae. *Proceedings of the Zoological Society of London* 140: 347-467.
- Millidge A.F. 1995. Some linyphiid spiders from south-east Asia. *Bulletin of the British Arachnological Society* 10: 41-56.
- Millidge A.F., Russell-Smith A. 1992. Linyphiidae from rain forests of Southeast Asia. *Journal of Natural History* 26: 1367-1404.
- Oi R. 1960. Linyphiid spiders of Japan. *Journal of the Institute of Polytechnics Osaka City University* 11(D): 137-244.
- Pickard-Cambridge O. 1880. On some new and rare spiders from New Zealand, with characters of four new genera. *Proceedings of the Zoological Society of London* 47 (for 1879): 681-703.
- Saaristo M.I. 1971. Revision of the genus *Maro* O. P.-Cambridge (Araneae, Linyphiidae). *Annales Zoologici Fennici* 8: 463-482.
- Saaristo M.I., Tanasevitch A.V. 2003a. *Helsdingenia* gen.n., a new micronetid genus from Old-World tropics (Aranei: Linyphiidae: Micronetinae). *Arthropoda Selecta* 11(2): 153-158.
- Saaristo M.I., Tanasevitch A.V. 2003b. A new micronetid spider genus from the Oriental Region (Aranei: Linyphiidae: Micronetinae). *Arthropoda Selecta* 11(4): 319-330.
- Simon E. 1886. Arachnides recueillis par M. A. Pavie (sous chef du service des postes au Cambodge) dans le royaume de Siam, au Cambodge et en Cochinchine. *Actes de la Société Linnéenne de Bordeaux* 40: 137-166.
- Simon E. 1894. Histoire naturelle des araignées, vol. 1. *Roret, Paris*, pp. 489-760.
- Simon E. 1899. Contribution à la faune de Sumatra. Arachnides recueillis par M. J. L. Weyers à Sumatra. (Deuxième mémoire). *Annales de la Société Entomologique de Belgique* 43: 78-125.
- Simon E. 1905. Arachnides de Java, recueillis par le Prof. K. Kraepelin en 1904. *Mitteilungen aus dem Naturhistorischen Museum in Hamburg* 22: 49-73.
- Tanasevitch A.V. 1998. *Gorbothorax* n. gen., a new linyphiid spider genus from the Nepal Himalayas (Arachnida, Araneae, Linyphiidae). *Bonner Zoologische Beiträge* 47: 421-428.
- Tanasevitch A.V. 2011. Linyphiid spiders (Araneae, Linyphiidae) from Pakistan and India. *Revue suisse de Zoologie* 118: 561-598.
- Tanasevitch A.V. 2014a. New species and records of linyphiid spiders from Laos (Araneae, Linyphiidae). *Zootaxa* 3841(1): 67-89.
- Tanasevitch A.V. 2014b. On the linyphiid spiders from Thailand and West Malaysia (Arachnida: Aranei: Linyphiidae). *Arthropoda Selecta* 23(4): 393-414.
- Tanasevitch A.V. 2015. Notes on the spider genus *Oedothorax* Bertkau, 1883 with description of eleven new species from India (Linyphiidae: Erigoninae). *Revue suisse de Zoologie* 122(2): 381-398.
- Tanasevitch A.V. 2016. A case of disjunct montane linyphiid species (Araneae) in the Palaeotropics, with notes on synonymy and the description of a new species. *Revue suisse de Zoologie* 123(2): 235-240.
- Tanasevitch A.V. 2017. New species and new records of linyphiid spiders from the Indo-Malayan Region (Araneae: Linyphiidae). *Zootaxa*, 4227(3) 325-346.
- Thorell T. 1890. Studi sui ragni Malesi e Papuani. IV, 1. *Annali del Museo Civico di Storia Naturale di Genova* 28: 1-419.

- Thorell T. 1895. Descriptive catalogue of the spiders of Burma, based upon the collection made by Eugene W. Oates and preserved in the British Museum. *British Museum (Natural History), London*, 406 pp.
- Thorell T. 1898. Viaggio di Leonardo Fea in Birmania e regioni vicine. LXXX. Secondo saggio sui Ragni birmani. II. Retitelariae et Orbitelariae. *Annali del Museo Civico di Storia Naturale di Genova* (series 2) 19: 271-378.
- Tu L.H., Li S.Q. 2004. A preliminary study of erigonine spiders (Linyphiidae: Erigoninae) from Vietnam. *The Raffles Bulletin of Zoology* 52: 419-33.
- Wunderlich J. 1974. Linyphiidae aus Nepal, II. Die Gattung *Oedothorax* Bertkau 1883 (Arachnida: Araneae). *Senckenbergiana Biologica* 55: 169-188.
- Wunderlich J. 1995. Beschreibung bisher unbekannter Spinnenarten und -Gattungen aus Malaysia und Indonesien (Arachnida: Araneae: Oonopidae, Tetrablemmidae, Telemidae, Pholcidae, Linyphiidae, Nesticidae, Theridiidae und Dictynidae). *Beiträge zur Araneologie* 4: 559-579.